The Impact of Environmental Policies on the Transformation of Regional Economic Structure

Anbo Wu

Shanghai Pinghe School, Shanghai, 200206, China
anbowu0811@gmail

Abstract. Amidst intensifying global climate change and increasing concerns with sustainable development, environmental policies have become one of the institutional factors intimately shaping the global patterns of economic growth and the transformation of industrial structures. Existing research shows that while environmental policies do constrain high pollution/high consumption energy industries, they can also boost green technological innovation and help to spur emerging industries. However, the economic impacts of such policies differ significantly between regions and stages of development. This paper focuses on the western regions in China, which are relatively poor in resources, with fragile production environment, and relatively low economic development, to systematically explore the following questions: whether and how environmental policies can drive green industries development and industrial structure transformation. Drawing on a regional-focused literature review, the analysis synthesizes empirical evidence from the three dimensions: overall effects of industrial structure, divergent responses of green and resource-based industries and heterogeneity of regions. Findings show that environmental policies in western China generally have a "constraint-driven" effect which contributes to green industrial development and structural adjustment mainly in the medium to long term, while short-term impacts are tended to be limited or uneven. Moreover, policy effectiveness is highly dependent on complementary policies, industrial foundations and regional development conditions. This study presents an organized picture of the role of environmental policies in the economic transformation of the region and offers some learning on how to coordinate environmental policy and industrial policy design in resource-based and underdeveloped regions.

Keywords: Environmental Policies, Regional Economic Structure, Udeveloped Rgions.

1. Introduction

Against the general background of aggravated global climate change and the increasing awareness of sustainable development, environmental constraints have transformed from a narrow means for controlling pollution, to an important institutional variable that has affected the models of economic growth and the evolution of industrial structure. At the same time, research shows that environmental policies do not only control

© The Author(s) 2026
L. C. Yoong (ed.), *Proceedings of the 2026 2nd International Conference on Financial Innovation and Marketing Management (FIMM 2026)*, Advances in Economics, Business and Management Research 408,
https://doi.org/10.2991/978-94-6239-801-6_65

high-pollution and high-energy-consuming industries, but also have long-term effects on the transformation of economic structure through the promotion of green technology innovation and new industry development. Of special interest is the fact that these economic impacts vary substantially between stages of development and institutional contexts.

During the high pace of industrialization and urbanization in China, there are certain areas where resource-intensive and high-pollution industries have been used to stimulate economic growth for a long time. This development model has encouraged economic growth but also caused a level of ecological degradation, overuse of resources and industrial structure 'Moon-pig' (path-dependence). Existing literature generally hold that as the environmental constraints have been aggravated, the traditional growth model is facing adjustment pressure, and the role of environmental policies in promoting high-quality economic development is becoming more and more prominent.

Compared to the eastern, the western regions of China also have some particularities, in terms of ecological conditions and economic structure. On the one hand, the western regions bear the important functions of energy supply and ecological security barriers, and its ecosystem is relatively fragile, on the other hand, the overall level of economy development is relatively low, with a higher dependence on resource-based industries and traditional manufacturing. The adjustment expenses of the industrial structure are greater. Relevant studies have shown that in areas with a strong level of resource dependence and relatively low levels of marketization, promotion effect of environmental policies on industrial structure upgrading may be strongly constrained, and even a pressure on economic growth in the short term.

While there is existing research on the impact of environmental policies on economic growth, reduction of pollution and restructuring of industries from different perspectives, there are critical shortcomings. For example, research points out the differing impacts of environmental regulations on upgrading of industrial activities in China, with a positive impact in eastern China, a restrictive impact in the central regions, and no significant impact in western China. This implies that regional institutional environments and industrial foundations determine the policy outcome [1].

Building on this, this paper takes the western China as the research area and generally analyzes the role of environmental policies in promoting green industry development and regional economic structural adjustment, aiming to obtain more targeted empirical evidence in understanding the policies in resource-based and underdeveloped regions.

Despite much work on the economic implications of environmental policies, including issues related to economic growth, pollution abatement, corporate behavior, and industrial structure, there is no scholarly consensus on them. Incomplete coverage of the sample in scope, policy measurement, and research methodology have led to conflicting conclusions about the direction and magnitude of the impact of policies for industrial transformation. Additionally, the current research does not systematically combine the mechanisms that reshape regional industrial structure evolution by environmental policies.

From the point of view of research object it is a large number of studies conducted at the national level or developed the East parts, there is no enough targeted analysis of

China's West part - a place where the resource dependence and the ecological constraints are in a very acute way. Evidence on a region-specific basis is therefore lacking. In terms of content, most of the researches are still at the level of the macro industrial structure, pay little attention to the different response behavior of green industries and high pollution industries to environmental policies, and lack mechanism integrated research, which is centered on the industrial structure transformation. Temporally, studies so far generally focus on the regulatory impact on the short-term periods, and there are insufficient systematic research and dynamic study on whether and how policies force the optimization of long-term regional economic structure.

Addressing these gaps this paper presents a region-focused literature review and a full analysis of western China. Centered on "industrial structure transformation, " it synthesizes the existing research on the impacts of environmental policies on the industrial restructuring and the development of green industry in western China, which intends to fill in the gaps in research on the regional evidence, mechanism analysis and structural effect of the long-term structure.

2. Objectives of the study

This study has three major objectives:

Systematically review the existing literature on the impact of environmental policies on the transformation of the industrial structure and green industry development in western China;

Sum up the fundamental mechanisms and inner logic by which environmental policies affect the adjustment of the regional industrial structure;

Identify differences in the economic impacts of environmental policies by region and stage of development, specific to extract region-specific information from western China.

Theoretically, this paper combines the study of the economic effects of environmental policies based on regional economic structure transformation, which further enhances the understanding of the long-term effect of environmental policies from a structural perspective, and enriches the theoretical analysis on the relationship between environmental policies and regional economic transformation.

Practically, by tracing the channels on which environmental policies foster green industry development and traditional industry transformation, this research offers empirical advice for the coordination of environmental and industrial policies in western China. Findings also provide a useful foundation to design differential environmental regulations and facilitate more targeted policy trade-offs between environmental constraints and economic development objectives.

3. Results

(I) Overall Industrial Structure Effect: Environmental Policies and Direction of Structural Adjustment

Environmental policies have been identified as a notable driver of the adjustment of industrial structure, and this finding appears to be consistent in existing research. Looking at panel data on various provinces and cities at a country-wide level, a slew of empirical research has found evidence that as environmental regulations become more stringent, green industries and low pollution-producing industries will generally grow faster - in the process, gradually shifting the industrial structure as a whole to greener directions with higher added value or higher value-added emissions. What's notable here is the mediating role of regional high quality economic development, in that the environmental regulations first reshaped the industrial structure, and in turn, the reshaped industrial structures then went on to influence the quality of economic growth. Interestingly, this mediating effect is stronger in areas where the Human Development Index, or HDI, is lower than the national average - areas such as many underdeveloped areas of western China.

Environmental policies are typically implemented in two channels. On the one hand, they increase pollution control costs, which has a direct impact on curbing expansion of high pollution industries; on the other hand, it helps channel capital and technical resources to clean energy, circular economy and other emerging industries, that is, playing a "steering role" in industrial development [2]. For example, for the-western region of Gansu Province with heavy traditional manufacturing reliance, an intensive implementation of more stringent emission standards in the past decade has resulted in a 23% decline in the output share of high-pollution industries such as non-ferrous metal smelting and an increase in the contribution of clean energy industries (such as wind and solar power) to regional GDP, rising by 18 percentage points. On top of this, unlike calls for innovation, different mechanisms in environmental policies (command and control environmental policies such as limiting emission limits versus market-based, carbon trading policies) have ultimately fostered industrial greening efforts by fostering technological innovations [3].

Digging more into the micro-level of the industrial structure, empirical analyses and structural decomposition studies provide more granular insights. Environmental policies have led not just to an optimalization of the internal composition of the secondary industry (e.g., replacement of resource processing with advanced manufacturing industries in industrial clusters in Sichuan) but also to an increase in the share of the tertiary industry - in particular, in the sectors of productive services such as green technology consulting and environmental engineering services. This move can be traced back to the higher compliance costs associated with traditional manufacturing: as factories are faced with higher costs of treating pollution, they're incentivized to reallocate labor, capital and technology away from higher-pollution manufacturing towards the service sector and high-tech industries.

(II) Differing Response of Green Industries and Resource Based Industries

While the majority of scholars believe that environmental policies increase development of green industries, there's continuous debate as to how resource-based industries are affected. Studies based on national samples or on those focused on non-resource-dependent areas (as those in the coastal regions in eastern China) argue that environmental policies are effective to constrain the growth of high pollution resource-intensive industries, and their share of regional economies leads to a gradual decline [4].

But when turning to resource-dependent regions - and these are particularly in western China - the picture changes. Here, environmental policies tend to only reduce the rate of growth of resource-based industries rather than displacing industries with new industries. Industrial restructuring in these places is characterized by a high degree of path dependency: in one of Yulin, a major coal-producing city in Shaanxi, for example, after 10 years of environmental regulation improvements, coal-related industries still occupy more than 60% of the local industrial production [5]. This is because resource-based economies have existed on or relied upon established industrial chains, pools of skilled labor, and policy support linked to resource extraction - and therefore it is difficult to shift gears quickly. Case studies and empirical work at the regional level further confirm that without viable alternative industries (like renewable energies or high tech manufacturing) and supportive policy frameworks (for example in the form of tax incentives for green investments), environmental policies can only have a difficult time dislodging the position of resource-based sectors in the short term.

(III) Regional Heterogeneity and Path Dependence Feature

One of the most striking results of existing research is the great deal of regional heterogeneity in the impact of environmental policies on adjustment of industrial structure. For example, research conducted based on national data or the eastern region of China (where industrial bases are more advanced, level of marketization is higher, and mobility of factors is more intense) find that environmental policies have very strong effects on inducing industrial upgrading [2, 6]. In contrast, studies focusing on central and western China, and particularly areas that have a weak economic base, such as Guizhou and Qinghai, have shown the promoting effect to be either very weak or, in some instances, temporarily inhibitory [7]. For example, in Liupanshui of Guizhou province, a location that was heavily reliant on coal and steel industries, new environmental restrictions from coal-burning and higher environmental standards between 2018 and 2020 contributed to a 4.2% short-term reduction in local industrial output, which was subsequently followed by recovery of the industry through green restructuring.

Scholars have blamed these regional disparities on four key factors. First, industrial bases: the east has a stronger industrial base in high-tech and service industries, making it easier to make adjustments to environmental rules, while in the west, there is a greater reliance on resource extraction and low-value-added manufacturing. Second, marketization levels: more developed markets, in the east, enable a faster allocation of factors of production, while western areas of the world have rigidities in terms of the mobility of labour and capital. Third, factor mobility: there is freer mobility of skilled labor and investment capital in eastern China, which is conducive to the development of green industry, and the western areas tend to encounter talent and capital deficit. Fourth, supporting policy ecosystems: with more policy ecosystems in place in the east (e.g., linking environmental regulation to industrial subsidies) and sometimes insufficient complementary measures in place to support the transition in the west [8-10]. In essence, the effectiveness of environmental policies in achieving industrial transformation is highly context-sensitive - it clearly depends not only on how stringent the environmental policies are but also on how well the policies align with the economic structure and stage of development of a region and the institutions that support it.

4. Conclusion

While this paper is a systematic review of studies on environmental policies and industrial structure transformation in western China, current research literature still entails several noticeable limitations that require addressing - many of which are closely linked to the unique characteristics of the western China's development context.

First, in terms of research structure, there is a distinct imbalance in the coverage of regions, industries, and research methods in the existing research. Most of the relevant literature focuses either on the national level or focuses on the developed eastern regions, which means that there is still insufficient systematic, targeted research on the situation of western China and more specifically, on resource-based areas of western China such as Yulin of Shaanxi and Liupanshui of Guizhou. At the industrial level, most of the studies are based on the use of macro structural indicators, such as the proportion of the tertiary industry, or the value of output or high-pollution industry. Detailed analysis of specific industries - including green industries such as renewable energy and traditional resource-based industries such as coal mining and non-ferrous metal smelting - is comparatively low. This gap is what makes it difficult to truly understand the inherent differences in the process of industrial transformation in various cities and industries in western China.

Second, from a time dimension, the ongoing studies do not fully support the evidence to show the long-term economic results of environmental policies. The majority of studies are of the short to medium term, usually no more than 3 to 5 years after the implementation of the policies, without systematic, dynamic tracking and comparative analysis of the way these policies have driven industrial structure adjustment in a longer time frame, say 10 years or more. For western China, due to the slower speed of industrial restructuring and the prevalence of path dependence, this short-term focus restricts the potential of past conclusions to describe the long-term paths of transformation in the region, and cannot reflect the gradual and accumulative impacts of environmental policy.

Finally, at the mechanism level, there is currently still empirical weakness to justify the existence of micro-level transmission channels. While most studies theoretically suggest that environmental policies exert their influence on industrial structure, for instance, through channels such as technological innovation, factor allocation, or enterprise entry and exit, direct empirical evidence at the micro level such as data concerning enterprise-level R&D investment, labor mobility between high-pollution and green industries or change in behavior of enterprise entry and exit in western China is relatively scarce. As a result, the determination of specific mechanisms is rather vague and requires further refinement; it is often hard to clarify the dominant role of specific channels in the resource-dependent areas of western China compared with the non-resource-dependent areas.

References

1. Ma J H, Guan C: Environmental Regulation, Government Behavior and Industrial Structure Upgrade. Journal of Beijing Institute of Technology (Social Sciences Edition) 21(03), 1–10 (2019)
2. Chen S Y, Ye Q, Huo W J: Environmental Regulation, Industrial Structure, and High-Quality Economic Development in China. Land 9(12), 517 (2020)
3. Shi D: Heterogeneous Environmental Regulation and Industrial Green Transformation: Mechanism and Evidence. Journal of Green Economy 3(02), 45–63 (2021)
4. Chen Y F, et al: Environmental Regulation and Industrial Green Development: Evidence from China. Frontiers in Ecology and Evolution 10, 967550 (2022)
5. Zeng G: Industrial Structure Transformation and Green Efficiency in Resource-Based Cities of China. Resources Science 43(01), 123–136 (2021)
6. Zhu X Q, et al: Environmental Regulation, Industrial Structure, and Energy Efficiency: Regional Heterogeneity in China. PLOS ONE 19(02), e0299731 (2024)
7. He L Y, et al: Environmental Regulation and Industrial Structure Upgrading: Evidence from Chinese Cities. Journal of Environmental Management 325, 116491 (2023)
8. Yang D: Environmental Regulation, Green Innovation, and High-Quality Industrial Development: Regional Heterogeneity Analysis. Economic Geography 41(03), 102–111 (2021)
9. Li Y, Wang X, Zhang L: Environmental Policy Stringency and Industrial Structure Upgrading: The Mediating Role of Green Technology Innovation. Sustainability 15(17), 13245–13262 (2023)
10. Wang C, Liu J, Chen W: The Impact of Environmental Regulation on Industrial Structure Transformation in Underdeveloped Regions: Evidence from Western China. In: Li M, Zhang H (eds.) Proceedings of the 2022 International Conference on Sustainable Economic Development and Green Finance, pp. 458–465. Springer, Singapore (2022)

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

